

Attorney's Docket No.: 06618/526001

REMARKS

In view of the following remarks and the foregoing amendments, reconsideration and allowance are respectfully requested.

Claims 1-19 were pending at the time of this action, with Claims 1, 3-6, 12, 16 and 18 being independent. Claims 3-6, 12-15 and 18 have been allowed. Claims 16 and 19 are currently amended. Therefore, Claims 1-19 are currently pending, with Claims 1, 3-6, 12, 16 and 18 being independent.

Claims 1, 2 and 7-11 stand rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Zhou et al (US Patent 6,787,749). This contention is respectfully traversed.

Claims 16, 17 and 19 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Hasegawa et al. (US Patent 5,917,620) in view of Antonelli et al (US Patent 6,259,108). This contention is respectfully traversed.

35 U.S.C. 102 - Rejection to Claims 1, 2, 7-11

Claim 1 is patentable over Zhou at least because Zhou fails to disclose each and every feature of the claim. For a claim to be anticipated by the prior art, it is necessary that a single prior art reference disclose each element of the claim under consideration. *Minnesota Mining and Mfg. Co. v. Johnson & Johnson Orthopedics, Inc.*, 976 F.2d 1559, 1565 (Fed. Cir. 1992).

Zhou discloses "a sensor array for receiving input signals, a frame memory array for temporarily storing a full frame, and an array of self-calibration column integrators for uniform column-parallel signal summation" (Zhou: Abstract). Fig. 1A of Zhou shows that the APS array 110 is coupled to a column buffer 120, and the column buffer 120 is coupled to a frame memory array 130 (Zhou: Col. 3, lines 33-62). The frame memory array

Attorney's Docket No.: 06618/526001

130 is then coupled to the column integrator. Hence, Zhou discloses that an electrical pixel signal should travel through a column buffer and a frame memory array prior to reaching the column integrator (Zhou: Col. 2, lines 34-42; Fig. 1A; Col. 3, lines 33-62). However, Claim 1 teaches an imaging device including "a photosensing array" and "an integrator array ... wherein integrators of each column are coupled to receive electrical pixel signals in said photosensing array." Thus, Claim 1 recites receiving signals from the photosensing array, and not from a frame memory array. Therefore, Claim 1 is patentable over Zhou at least because Zhou fails to disclose each and every feature of Claim 1.

Furthermore, the memory 230 and the integrator 240 in Zhou are functionally different from the assertions made in the office action (Zhou: Figs. 2A, 2B). For example, the memory 230 samples an input voltage from the buffer 220 to store the sampled voltage for subsequent integration performed by the following column integrator 240 (Zhou: "an input voltage  $V_{in1}$  is sampled onto the memory capacitor cell 231," Figs. 2A, 2B; Col. 6, lines 10-11, 39-42). The photoelectric current in the pixel sensor 210 is converted into a voltage signal prior to reaching the memory 230. Therefore, the memory 230 in Zhou is configured for sampling an input voltage, rather than integrating a photoelectric current and converting the current into a voltage signal as asserted in the office action (Office Action: page 2, Item 2). Hence, Claim 1 is further distinguishable and patentable over Zhou in contrast to the assertions made in the office action.

Therefore, each and every limitation of Claim 1 is not shown in Zhou. For at least this reason, the Applicants respectfully submit that Claim 1 is patentable over Zhou and the rejection under 35 U.S.C. 102 should be withdrawn.

Attorney's Docket No.: 06618/526001

Claims 2, 7-11 are allowable because they each depend upon an allowable base claim (base Claim 1). Claims 2, 7-11 are also allowable for reciting patentable subject matter in their own right.

35 U.S.C. 103 - Claims 16, 17, and 19

Claim 16 is patentable over Hasegawa and Antonelli at least because the cited references would render the invention unsuitable for its intended purpose. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification (MPEP 2143).

Antonelli teaches an optical image apparatus with a contact image sensor (Antonelli: Abstract). Antonelli teaches that the contact image sensor can have a linear array optical sensor and can have light sensing pixels with CCD pixels, CMOS APS pixels, or photo-diode pixels (Antonelli: Abstract). Hasegawa teaches "an image reading apparatus comprising plural line sensors for converting light from an object into image signals" and "charge transfer unit for transferring the image signals" (Hasegawa: Abstract). The image sensor of Hasegawa uses "so called TDI (time delay and integraton)" based on integrating and transferring charges between CCD sensors and shift registers to output units (Hasegawa: Col. 2, lines 56-67; Col. 3, lines 1-40).

However, Claim 16 recites "internally converting radiation-induced charge in each pixel of the linear sensing array into a voltage representing an electrical pixel signal" (emphasis added). Therefore, Claim 16 recites that the captured radiation in each pixel is internally converted into a voltage within the linear sensing array itself. However, Hasegawa teaches that the

Attorney's Docket No.: 06618/526001

electrical pixel signal is not converted into a voltage until after the signal exits the CCD linear image sensor 1300 and enters the Analog Signal Processing Unit 101 (Hasegawa: Fig. 10A, Col. 5, lines 26-34; Col. 8, lines 2-10; Col. 9, lines 33-44). Hence, Hasegawa fails to teach or suggest all of the features of Claim 16 at least because Hasegawa teaches that the conversion from charge to voltage occurs after integration occurs and Claim 16 recites that the electrical pixel signal is converted into a voltage within the linear sensing array itself.

Furthermore, Hasegawa teaches that the CCD linear image sensor performs integration while the electrical pixel signal is still in the form of charge and not in the form of voltage (Hasegawa: Col. 6, lines 23-35). Therefore, Hasegawa fails to teach or suggest all of the features of Claim 16 at least because Hasegawa teaches that the integration occurs within the linear image sensor and Claim 16 recites integration that occurs within a separate linear integrator array.

Moreover, Antonelli does not remedy the deficiencies of Hasegawa at least because the suggested combination of Antonelli and Hasegawa could not integrate charge within the linear image sensor if CMOS APS pixels were used instead of CCD cells for the linear image sensor. CMOS APS pixels would be needed to convert the charge into voltage within the linear image sensor itself. However, Using CMOS APS pixels would render the suggested combination unsuitable for its intended purpose. The suggested combination of Hasegawa and Antonelli could only perform integration within the linear image sensor, according to the teachings of Hasegawa, if CCD cells were used as the linear image sensor. Also charge cannot be shifted along the various charge shift registers between the CCD cell arrays if the charge had already been converted into a voltage (Hasegawa: Figs. 8, 9A, 9B). Therefore, Hasegawa and Antonelli cannot be combined

Attorney's Docket No.: 06618/526001

to both perform integration within the linear image sensor as taught by Hasegawa and convert the charge to voltage within the linear image sensor itself as recited by Claim 16. Therefore, Claim 16 is patentable over the combination of Hasegawa and Antonelli.

Claim 16 is further patentable over Hasegawa and Antonelli at least because Antonelli fails to remedy the deficiencies of Hasegawa in not teaching or suggesting that integration occurs after the charge in the linear sensing array is converted into voltage. Claim 16 is patentable for at least this reason alone.

Furthermore, Antonelli also fails to teach or suggest that integration should occur in a separate integration array and not within the linear sensing array itself. Claim 16 is also patentable for this reason.

Claims 17 and 19 are allowable because they each depend upon an allowable base claim (base Claims 16 and 18). Claim 19 is amended depend upon an allowed base claim, Claim 18. Therefore, Claim 19 is patentable at least because this dependent claim depends upon an allowable base claim, as well as for reciting patentable subject matter in its own right.


Attorney's Docket No.: 06618/526001

Conclusion

In view of the amendments and remarks herein, the Applicants believe that Claims 1-19 are in condition for allowance and ask that these pending claims be allowed. The foregoing comments made with respect to the positions taken by the Examiner are not to be construed as acquiescence with other positions of the Examiner that have not been explicitly contested. Accordingly, Applicants' arguments for patentability of a claim should not be construed as implying that there are not other valid reasons for patentability of that claim or other claims.

No fee is believed to be due at this time. Please apply all applicable charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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